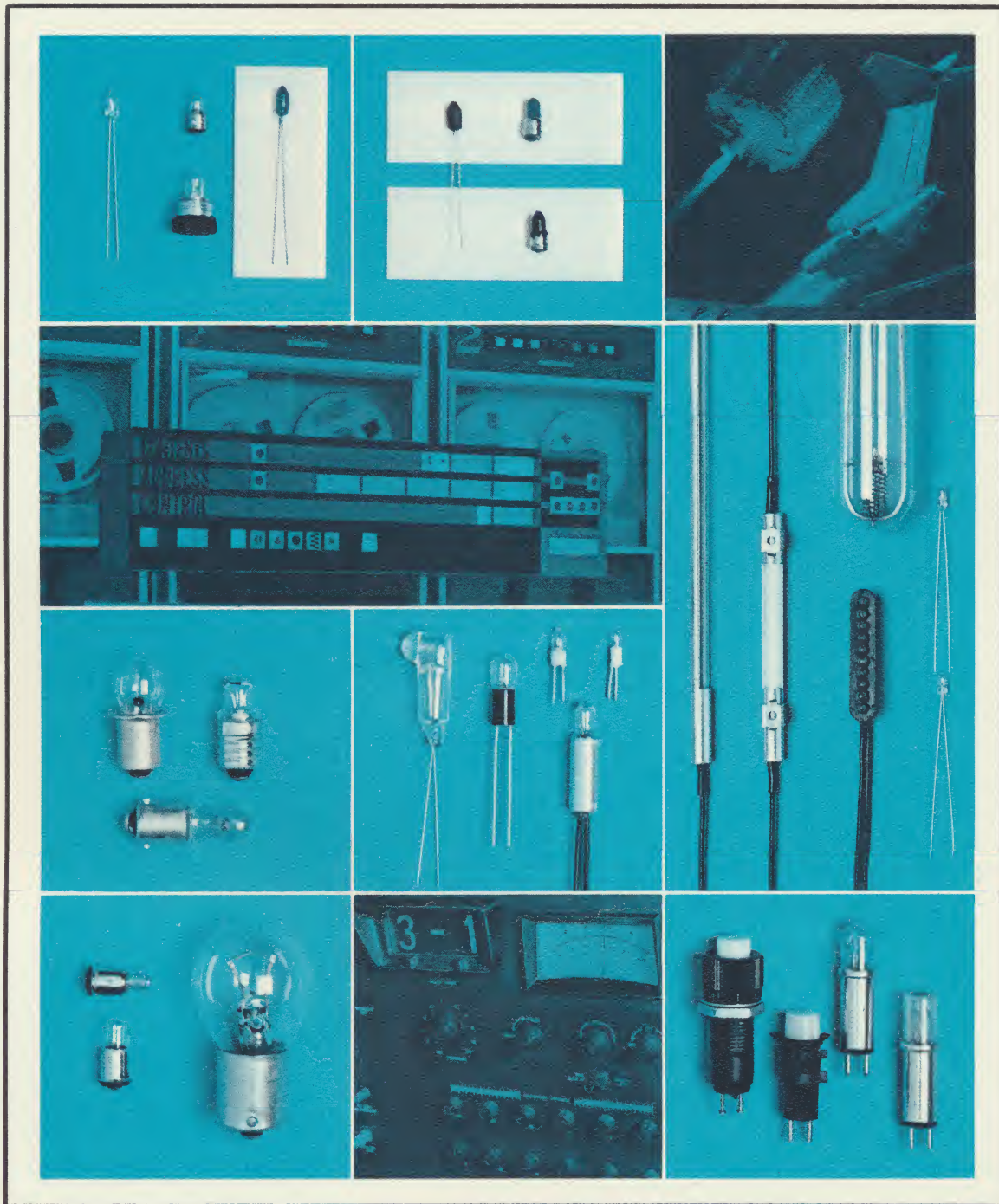


CHICAGO MINIATURE LAMP WORKS



catalog no. CMT-2
subminiature lamps



SUBMINIATURE LAMPS

ORDERING INFORMATION

To order Chicago Miniature subminiature lamps, specify lamp numbers and quantities required. When ordering from our quotation, please refer to the quotation number.

Inquiries and orders for special subminiature lamps should be accompanied by complete specifications: type of lamp application, base, bulb, volts, amperes, candlepower, life, dimensional and environmental requirements.

AGED AND SELECTED LAMPS

Where precise light output is of primary importance, Chicago Miniature lamps are Aged and Selected. All T-¾ and T-1 lamps are aged a minimum of 10 hours then individually measured for candlepower. T-1¼, T-1½ and T-1¾ lamps are Aged and Selected to specific customer requirements.

Aging and Selecting is a Chicago Miniature process developed and proven reliable over many years.

COLOR COATINGS

Lamps are certified to MIL-C-25050, MIL-L-25467C and MIL-L-27160.

VIBRATION AND SHOCK

Lamps are tested to MIL Standard 202C-Method 202A for vibration and Method 202B for shock.

HEAT

Above 300°F, the solder on based lamps may soften and deform, the basing cement may loosen, evolved gas may attack the filament or the glass envelope may soften.

DESIGN VOLTAGE

Design voltage represents the voltage at which the lamp, when operated, will yield its rated amperage, candlepower, and life characteristics.

DESIGN AMPERAGE

Design amperage represents the value of current flowing through the lamp when operated at design voltage.

M.S.C.P.

Light output of subminiature lamps is generally rated in terms of Mean Spherical Candlepower (M.S.C.P.) which is the average of the total output of the lamp as measured in a photometric reflectance sphere at design voltage.

LIFE

Lamp life is the average life obtained under static laboratory conditions when the lamp is operated at design voltage. Actual life may differ from laboratory life due to the effects of shock, vibration, voltage variations, and environmental conditions encountered in lamp applications.

LAMP RERATING

Electrically, subminiature lamps are dynamic devices. Candlepower, current, and life may be varied for all subminiature lamps by operating the lamps at other than design voltage. Rerating may be accomplished by the following formulae:

RERATED M.S.C.P. =

$$\left(\frac{V}{V_1}\right)^{3.5} \times \text{M.S.C.P. AT DESIGN VOLTS}$$

RERATED LIFE =

$$\left(\frac{V_1}{V}\right)^{12} \times \text{LIFE AT DESIGN VOLTS}$$

RERATED CURRENT =

$$\left(\frac{V}{V_1}\right)^{.55} \times \text{CURRENT AT DESIGN VOLTS}$$

V = APPLICATION VOLTAGE

V₁ = DESIGN VOLTAGE

BULB

The bulb is the glass envelope which houses the lamp filament assembly and contains the vacuum or gas. A letter and number identifies bulb shape and approximate bulb diameter in eighths of an inch.

BASE

The base provides electrical contact and support for the lamp. Unbased lamp leads are dumet wire. T-¾ and T-1 lamp leads are tin-plated for solderability.

MAXIMUM OVERALL LENGTH (MOL)

Maximum overall length is the largest total length which the lamp or the lamp and base will not exceed.

FILAMENT

The filament is the light emitting portion of the lamp. A prefix letter indicates whether the wire is straight (S), coiled (C) or coiled-coil (CC) and a number designates the geometric configuration of the filament support wires. Popular filament shapes are:

FILAMENT STYLES



S-2



C-2F



C-2V



C-2R



C-6



2/C-2R

SPECIAL SUBMINIATURE PRODUCTS



Your specific application may require specially designed lamps such as those illustrated. Send us your special application needs—we will be pleased to submit our recommendations.

1. T-1½ SURGICAL LAMP

2. T-1½ MICRO-POWER LAMP

3. T-1 DOUBLE FILAMENT LAMP

4. T-1 FLYING SAUCER LAMP

5. T-1 PHONO-CARTRIDGE LAMP

6. T-1 AXIAL LEAD LAMP

7. T-1 SHORT FLAT TOP LAMP

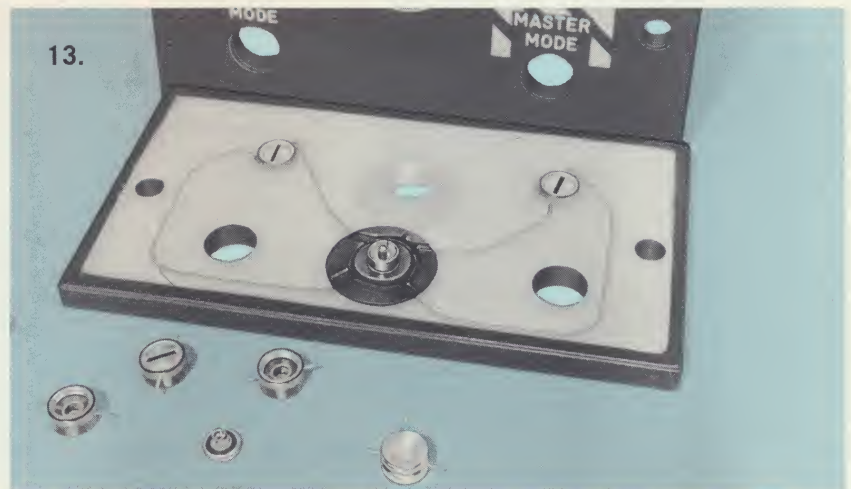
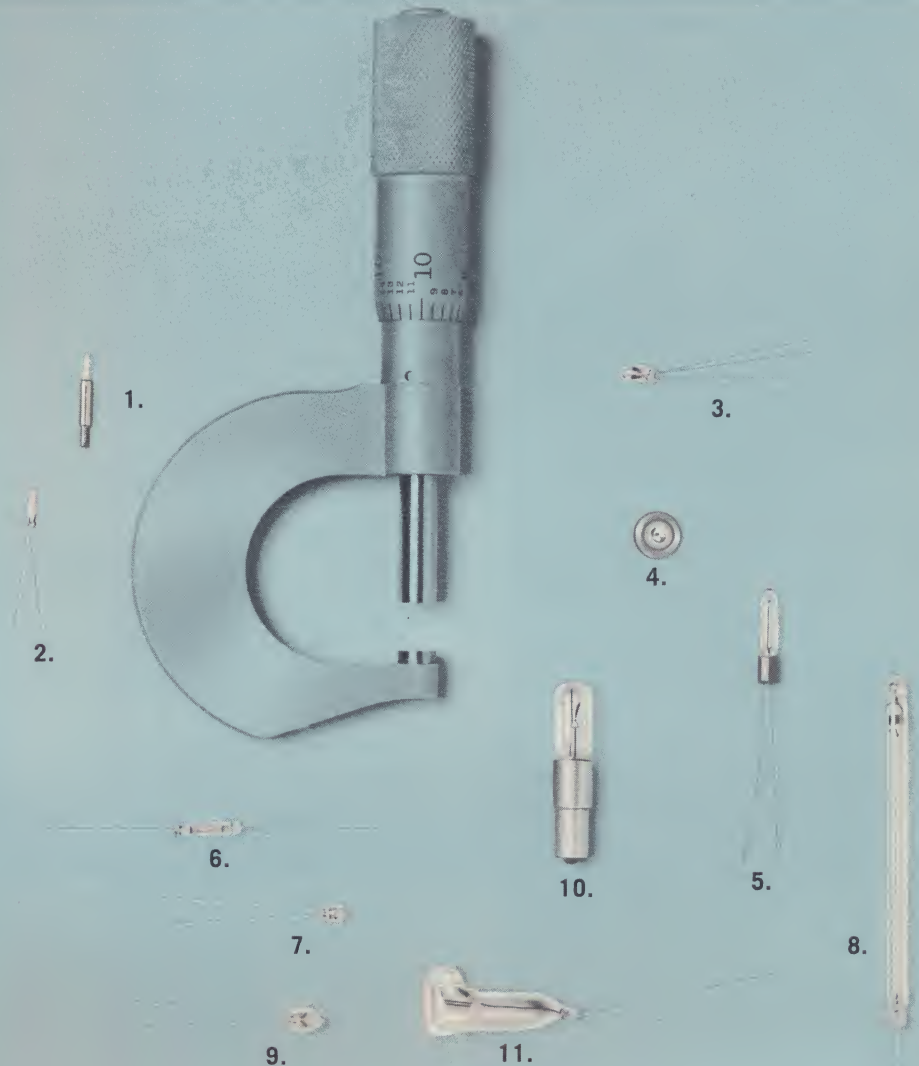
8. T-1¼ THIN LINE LAMP

9. T-1¼ HELIUM RETARDANT LAMP

10. T-1½ DENTAL LAMP

11. T-1¾ RIGHT ANGLE LENS END LAMP

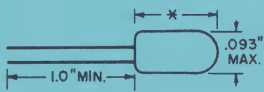
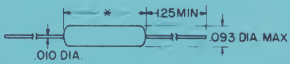
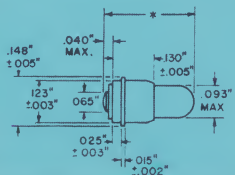
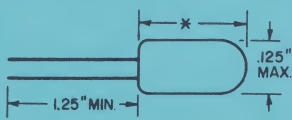
12-13. T-1 FLYING SAUCER



SUBMINIATURE INCANDESCENT LAMPS

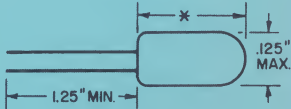
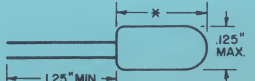
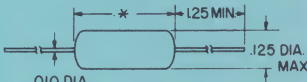
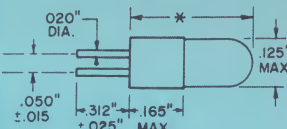
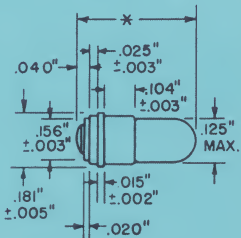


T

SECTION	Base	Symbols	Lamp Number	DESIGN		M.S.C.P.	Life (Hrs.)	Fila-ment Shape	* M.O.L. Inches	
				Volts	Amps.					
T-3/4										
A	Wire Terminal 	B	CM8-712 CM8-166 CM8-534 CM8-586 CM8-537 6803 6833 7133 8666 7153 CM8-725F1	1.15 1.5 2.5 2.5 5.0 5.0 5.0 5.0 5.0 5.0 5.0	.09 .15 .11 .32 .015 .06 .06 .075 .08 .115 .125	.003 .015 .001 .50 .02 .032±25% .053±25% .088±25% .15±25% .147±25% .22±25%	5,000 3,000 10,000 50 1,000 100,000 100,000 25,000 3,000 40,000 5,000	C-2R S-2 C-2R S-2 C-12 C-2R C-2R C-2R C12R C-2R C-2R	0.187 0.375 0.187 0.359 0.187 0.187 0.187 0.187 0.187 0.187 0.187	
	Axial Lead 		6805 6805AS15 6835 6835AS15 7135 7135AS15 7155 7155AS15	5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0	.06 .06 .06 .06 .075 .075 .115 .115	.032±25% .032±15% .053±25% .053±15% .088±25% .088±15% .147±25% .147±15%	100,000 100,000 100,000 100,000 25,000 25,000 40,000 40,000	C-6 C-6 C-6 C-6 C-6 C-6 C-6 C-6	0.35 0.35 0.35 0.35 0.35 0.35 0.35 0.35	
	Micro-Midget Flanged Base 		8587 8587AS15 8913 8913AS15 8828 8828AS15 8383 8383AS15 8270 8270AS15	5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0	.06 .06 .06 .06 .075 .075 .08 .08 .115 .115	.032±25% .032±15% .053±25% .053±15% .088±25% .088±15% .15±25% .15±15% .147±25% .147±15%	100,000 100,000 100,000 100,000 25,000 25,000 3,000 3,000 40,000 40,000	C-2R C-2R C-2R C-2R C-2R C-2R C-2R C-2R C-2R C-2R	0.30 0.30 0.30 0.30 0.30 0.30 0.30 0.30 0.30 0.30	
	T-1									
	D	Wire Terminal 		CM8-798 CM8-665 CM8-732 CM8-900 CM8-711 CM8-846 2128 CM8-1086 CM8-602 CM8-1062 CM8-729 6802 6802AS15 6801 6801AS15 680 680AS15 6832 6832AS15 6831 6831AS15 683 683AS15 CM8-683F1 7132 7132AS15 7131 7131AS15 713 713AS15 CM8-621	1.25 2.5 2.5 2.5 2.5 3.0 3.0 3.0 5.0	.004 .048 .10 .123 .32 .008 .0125 .06 .017 .03 .045 .06 .06 .06 .06 .06 .06 .06 .06 .06 .06 .06 .063 .075 .075 .075 .075 .075 .08	.045±25% .03±25% .10±25% .103±25% .21±25% .001 .001 .03±25% .005±25% .025±25% .035±25% .032±25% .032±15% .032±25% .032±15% .032±25% .032±15% .032±15% .053±25% .053±15% .053±25% .053±15% .053±25% .053±15% .060±25% .088±25% .088±15% .088±25% .088±15% .157±25%	1,000 60,000 10,000 3,000 5,000 16,000 16,000 100,000 10,000 75,000 10,000 100,000 100,000 200,000 200,000 200,000 200,000 100,000 100,000 100,000 100,000 100,000 60,000 25,000 25,000 25,000 25,000 25,000 3,000	C-2R S-2 C-2R C-6 C-2R C-6 C-6 C-2R	0.25 0.40 0.25 0.31 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.145 0.145 0.187 0.187 0.25 0.25 0.145 0.145 0.187 0.187 0.25 0.25 0.145 0.145 0.187 0.187 0.25 0.25 0.25

Symbol Explanation: Bold face type indicates Industry Standard lamps. B=Bulb MOD varies. * =Filaments in parallel for rating. ‡=Special Base.
**=Longer lead length.



SECTION	Base	Symbols	Lamp Number	DESIGN		M.S.C.P.	Life (Hrs.)	Fila- ment Shape	* M.O.L. Inches
				Volts	Amps.				
T-1									
A	Wire Terminal 		7152 7152AS15 7151 7151AS15 715 715AS15 CM8-1175 CM8-1175AS15 CM8-1179 CM8-1179AS15 CM8-715F1 CM8-1096 CM8-1088 CM8-1089 CM8-1111 CM8-1092 6838	5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 10.0 12.0 14.0 18.0 28.0	.115 .115 .115 .115 .115 .115 .125 .125 .125 .125 .125 .145 .027 .06 .065 .026 .024	.147±25% .147±15% .147±25% .147±15% .147±25% .147±15% .22±25% .22±15% .22±25% .22±25% .22±25% .16±25% .10±25% .15±25% .15±25% .15±25% .15±25%	40,000 40,000 40,000 40,000 40,000 40,000 5,000 5,000 5,000 5,000 5,000 10,000 10,000 16,000 12,000 10,000 16,000	C-2R C-2R C-2R C-2R C-2R C-2R C-2R C-2R C-2R C-2R C-2R C-2R C-2F C-2F C-2F C-2F	0.145 0.145 0.187 0.187 0.25 0.25 0.145 0.145 0.187 0.187 0.25 0.25 0.25 0.25 0.25 0.25 0.25
	Wire Terminal Double Filament 	* * * *	CM8-871 CM8-860 CM8-863 CM8-870	5.0 5.0 5.0 5.0	.11 .12 .12 .21	.150 .064 .106 .250	14,000 60,000 60,000 1,000	2/C-2R 2/C-2R 2/C-2R 2/C-2R	0.28 0.28 0.28 0.28
	Axial Lead 		6804 6804AS15 6834 6834AS15 7134 7134AS15 7154 7154AS15	5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0	.06 .06 .06 .06 .075 .075 .115 .115	.032±25% .032±15% .053±25% .053±15% .088±25% .088±15% .147±25% .147±15%	100,000 100,000 100,000 100,000 25,000 25,000 40,000 40,000	C-6 C-6 C-6 C-6 C-6 C-6 C-6 C-6	0.40 0.40 0.40 0.40 0.40 0.40 0.40 0.40
	Bi-Pin Base 		CM7-732 CM7-682 CM7-685 CM7-714 CM7-718	2.5 5.0 5.0 5.0 5.0	.10 .06 .06 .075 .115	.10±25% .032±25% .053±25% .088±25% .147±25%	10,000 200,000 100,000 25,000 40,000	C-2R C-2R C-2R C-2R C-2R	0.36 0.36 0.36 0.36 0.36
	Sub-Midget Flanged Base 		CM8-1102 CM8-1103 CM8-1097 CM8-605 682 682AS15 685 685AS15 714 714AS15 CM8-625 718 718AS15 CM8-718F1 CM8-1098 CM8-1099 CM8-1112 CM8-1100 6839	1.5 3.0 3.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 10.0 12.0 14.0 18.0 28.0	.075 .06 .12 .017 .06 .06 .06 .06 .075 .075 .08 .115 .115 .125 .027 .06 .065 .026 .024	.03 .03 .15 .005 .032±25% .032±15% .053±25% .053±15% .088±25% .088±15% .15±25% .147±25% .147±15% .22±25% .10±25% .15±25% .15±25% .15±25% .15±25%	16,000 100,000 16,000 10,000 200,000 200,000 100,000 100,000 25,000 25,000 3,000 40,000 40,000 5,000 10,000 16,000 12,000 10,000 16,000	C-2R C-2R C-2R C-2R C-2R C-2R C-2R C-2R C-2R C-2R C-2R C-2R C-2R C-2R C-2F C-2F C-2F C-2F C-2F	0.375 0.375 0.375 0.375 0.375 0.375 0.375 0.375 0.375 0.375 0.375 0.375 0.375 0.375 0.375 0.375 0.375 0.375 0.375

Symbol Explanation: Bold face type indicates Industry Standard lamps. B=Bulb MOD varies. *=Filaments in parallel for rating. ‡=Special Base.
**=Longer lead length.

SUBMINIATURE INCANDESCENT LAMPS



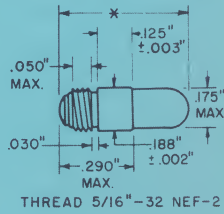
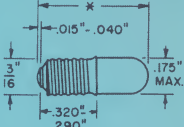
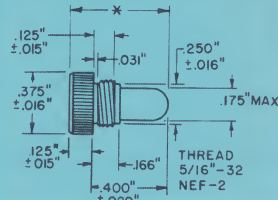
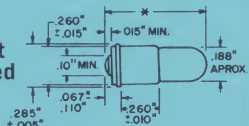
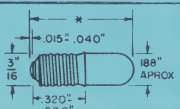
T-1 1/4

SECTION	Base	Symbols	Lamp Number	DESIGN		M.S.C.P.	Life (Hrs.)	Fila-ment Shape	* M.O.L. Inches
				Volts	Amps.				
A	Wire Terminal	B	CM8-631	1.35	.06	.006	500	C-2R	0.46
			CM8-758	2.5	.16	.265		S-2	0.393
			CM8-266	2.5	.25		500	S-6	0.406
			CM8-743	2.5	.275		25	S-6	0.406
			CM8-767	2.5	.28			C-6	0.406
			CM8-769	2.5	.295	.63		C-6	0.375
			CM8-771	2.5	.30			C-6	0.406
			CM8-742	2.5	.325	.720	3 1/2	S-2	0.406
			CM8-768	2.5	.40			C-6	0.406
		B	CM8-827	2.5	.40	.30		C-2R	0.485
		B	CM8-655	2.5	.40	.55	30	C-2R	0.46
			CM8-127	2.5	.41	.85	6	C-6	0.44
			CM8-840	2.5	.42	.85		C-6	0.375
			CM8-841	2.5	.44	.82	1 1/2	C-6	0.433
			CM8-847	2.6	.46	.85		C-6	0.433
		B	CM8-159	2.7	.31			S-2	0.365
		B	CM8-465	3.0	.193	.23		C-6	0.469
			324	3.0	.19	.25	350	C-2R	0.438
			2139	3.0	.19	.25	350	C-2R	0.438
			2127	3.0	.19	.25	350	C-2R	0.438
		B	CM8-857	3.0	.38	.34	5,000	C-2R	
		B	CM8-77	3.5	.03	.05	500	S-2	0.50
		B	CM8-336	3.8	.35		50	S-2	0.625
			CM8-858	3.8	.38			C-6	0.375
		B	CM8-816	4.5	.295	1.05	95	C-2R	0.37
			CM8-676	5.0	.21	.25		C-2R	0.438
		B	CM8-661	6.0	.04	.03	1,000	C-2V	0.46
			2114	6.0	.06	.12	3,000	C-2R	0.46
		B	CM8-853	6.0	.15	.33		C-2R	0.38
		B	CM8-419	6.0	.18	.50	400	C-2R	
		B	CM8-634	6.0	.20	.63	500	C-2R	0.46
		B	CM8-610	6.3	.20	.55	3,000	C-2R	0.46
		B	CM8-608	10.0	.015	.003	10,000	C-2F	0.46
		B	CM8-640	14.0	.08	.43	1,000	C-2F	0.46
			8627	28.0	.04	.34	1,000	C-2F	0.46
B	Bi-Pin Base		CM7-636	1.35	.06	.006	500	C-2R	0.625
			CM7-656	2.5	.40	.55	30	C-2R	0.625
		B	CM7-637	3.0	.19	.25	350	C-2R	0.625
		B	CM7-660	6.0	.04	.03	1,000	C-2V	0.625
		B	CM7-628	6.0	.20	.63	500	C-2R	0.625
		B	CM7-646	14.0	.08	.43	1,000	C-2F	0.625
			CM7-632	28.0	.04	.36	1,000	C-2F	0.625
C	Special Midget Flanged Base	B	CM8-636	1.35	.06	.006	500	C-2R	0.625
		B	CM8-656	2.5	.40	.55	30	C-2R	0.625
		B	CM8-637	3.0	.19	.25	350	C-2R	0.625
		B	CM8-637L	3.0	.19	.25	3,500	C-2R	0.625
			CM8-672	5.0	.21	.35		C-2R	0.625
		B	CM8-660	6.0	.04	.03	1,000	C-2V	0.625
		B	CM8-628	6.0	.20	.63	500	C-2R	0.625
		B	CM8-609	10.0	.015	.003	10,000	C-2F	0.625
		B	CM8-646	14.0	.08	.43	1,000	C-2F	0.625
			8632	28.0	.04	.34	1,000	C-2F	0.625
		‡	737	28.0	.045	.30 ± 15%	16,000	C-2F	0.55

Symbol Explanation: Bold face type indicates Industry Standard lamps. B=Bulb MOD varies. *=Filaments in parallel for rating. ‡=Special Base. **=Longer lead length.

T SUBMINIATURE INCANDESCENT LAMPS



SECTION	Base	Symbols	Lamp Number	DESIGN		M.S.C.P.	Life (Hrs.)	Fila-ment Shape	* M.O.L. Inches
				Volts	Amps.				
T-1¼									
D	Special Screw Base 	B	CM8-641	1.35	.06	.006	500	C-2R	0.55
			329	2.5	.40	.55	30	C-2R	0.55
			325	3.0	.19	.25	350	C-2R	0.55
		B	CM8-673	4.5	.285	1.05	95	C-2R	0.50
		B	CM8-662	6.0	.04	.03	1,000	C-2V	0.55
			371	6.0	.06	.12	3,000	C-2R	0.55
		B	CM8-645	6.0	.20	.63	500	C-2R	0.55
		B	CM8-552	6.3	.20	.55	3,000	C-2R	0.55
		B	CM8-606	10.0	.015	.003	10,000	C-2F	0.55
	B	CM8-644	14.0	.08	.43	1,000	C-2F	0.55	
		8635	28.0	.04	.34	1,000	C-2F	0.55	
E	Midget Screw Base 		CM8-675	5.0	.21	.25		C-2R	0.531
		B	CM8-421	6.0	.18	.50	400	C-2R	0.531
		B	CM8-624	28.0	.04	.36	1,000	C-2F	0.56
F	Threaded Knurled Base 	B	CM8-647	1.35	.06	.006	500	C-2R	0.56
		B	CM8-826	2.5	.40	.30		C-2R	0.54
			326	2.5	.40	.55	30	C-2R	0.56
			323	3.0	.19	.25	350	C-2R	0.547
			323L	3.0	.19		3,500	C-2R	0.55
		B	CM8-657	6.0	.04	.03	1,000	C-2V	0.56
			8639	6.0	.20	.63	500	C-2R	0.56
		B	CM8-607	10.0	.015	.003	10,000	C-2F	0.56
		B	CM8-654	14.0	.08	.43	1,000	C-2F	0.54
			8623	28.0	.04	.34	1,000	C-2F	0.56
T-1½									
A	Wire Terminal 	B	CM8-961	2.0	.40			C-2R	0.50
			CM8-85	2.4	.04	.001		C-2R	0.484
			CM8-190	2.5	.20	.104	3,000	C-2R	0.475
			CM8-971	2.5	.28		100	S-2	0.50
		B	CM8-745	2.5	.32	.57	50	S-2	0.37
			CM8-519	2.5	.35	.36		C-2R	0.438
			CM8-970	2.5	.40			C-6	0.375
			CM8-972	2.5	.42			S-2	0.50
			CM8-973	2.5	.45			S-2	0.531
			CM8-749	2.5	.45	.80	15	C-6	0.396
		B	CM8-762	2.6	.31	.66		C-6	0.39
			CM8-962	4.5	.42	1.3	45	C-2V	
		B	CM8-963	5.0	.35	1.6	200	C-2R	0.688
		B	CM8-84	6.0	.083	.28	1,000	C-2R	0.50
		B	CM8-423	6.0	.12	.24	2,000	C-2R	0.41
		B	CM8-422	6.0	.18	.50	400	C-2R	0.41
			CM8-975	6.0	.203	.74	390	C-2R	0.45
			CM8-192	6.0	.20	.75	2,000	C-2R	0.475
			B	CM8-969	6.5	.35	1.1	100	C-2V
		CM8-194	28.0	.04	.40	5,000	C-2F	0.475	
B	Midget Flanged Base 	B	CM8-734	6.3	.20	.55	3,000	C-2R	0.625
C	Midget Screw Base 		CM8-189	2.5	.20	.104	3,000	C-2R	0.575
			CM8-191	6.0	.20	.75	2,000	C-2R	0.60
			CM8-658	6.0	.203	.74	390	C-2R	0.594
			CM8-193	28.0	.04	.40	5,000	C-2F	0.575

Symbol Explanation: **Bold face** type indicates Industry Standard lamps. **B**=Bulb MOD varies. * = Filaments in parallel for rating. ‡ = Special Base. ** = Longer lead length.

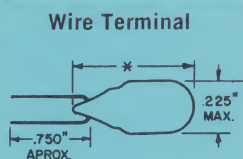


SUBMINIATURE INCANDESCENT LAMPS T

SECTION

T-1³/₄

A



Wire Terminal

B

B

B

B

B

B

B

**

B

**

B

1728

CM8-619

1783

CM8-747

2169

CM8-234

CM8-663

CM8-757

1738

CM8-799

2158

2156

CM8-523

CM8-88

CM8-335

CM8-241

CM8-339

CM8-526

CM8-748

CM8-813

CM8-756

CM8-805

CM8-806

CM8-807

CM8-416

CM8-442

CM8-452

CM8-409

CM8-1083

2164

2134

1730

CM8-104

CM8-664

CM8-728

1784

CM8-446L

CM8-773

CM8-785

2190

2180

1739

8350

2181

2112

CM8-86

1.35

2.5

2.5

2.5

2.5

2.5

2.5

2.5

2.7

3.0

3.0

3.0

3.0

3.6

3.8

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3.8

4.5

4.5

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6.3

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6.3

6.3

6.3

8.0

.06

.057

.20

.29

.350

.39

.40

.40

.06

.015

.015

.03

.38

.03

.38

.40

.40

.40

.50

.12

.47

.06

.06

.115

.18

.18

.20

.22

.22

.04

.04

.04

.06

.20

.20

.20

.22

.30

.47

.04

.04

.075

.15

.20

.20

.06

.01

.031

.22

.45

.210

.55

.75

.04

.002

.002

.02

.003

.95

.05

2.15

.032

.053

.147

.34

.34

.45

.10

.60

.03

.03

.03

.05

.10

.64

.34@5V

.63

1.10

2.5

.02

.02

.22

.45

.40

.55

.10

500

500

500

10,000

30

30

6,000

10,000

10,000

1,800

500

100,000

50

25,000

200,000

100,000

40,000

3,000

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500

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C-2R

C-2R

C-2R

C-2V

C-2V

C-2V

C-2R

C-2R

C-2V

C-2R

C-2R

0.52

0.52

0.52

0.405

0.495

0.813

0.52

0.50

0.52

0.595

0.52

T SUBMINIATURE INCANDESCENT LAMPS



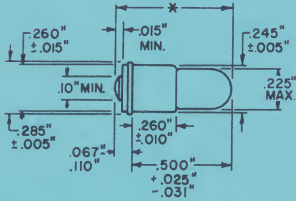
T-1 3/4

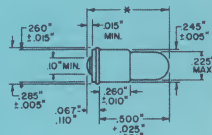
SECTION	Base	Symbols	Lamp Number	DESIGN		M.S.C.P.	Life (Hrs.)	Fila-ment Shape	* M.O.L. Inches
				Volts	Amps.				
B	Wire Terminal (Continued) 		1859	10.0	.014	.002	10,000	C-2F	0.52
			1869	10.0	.014	.002	10,000	C-2F	0.52
			2107	10.0	.04	.08	30,000	C-2F	0.52
		B	CM8-946	11.0	.022	.03	10,000	C-2F	0.52
			2182	14.0	.08	.30	50,000	C-2F	0.52
		**	2192	14.0	.08	.30	50,000	C-2F	0.52
			2160	14.0	.08	.50	750	C-2F	0.52
		**	2195	14.0	.08	.50	750	C-2F	0.52
			1705	14.0	.08	.50	750	C-2F	0.52
			1705L	14.0	.088	.50	10,000	C-2F	0.52
			2162	14.0	.088	.50	10,000	C-2F	0.52
			2102	18.0	.04	.15	1,000	C-2F	0.52
			CM8-425	22.0	.04	.30	2,000	C-2F	0.52
			2187	28.0	.04	.30	25,000	C-2F	0.52
		**	2197	28.0	.04	.30	25,000	C-2F	0.52
			1762	28.0	.04	.34	1,000	C-2F	0.52
			1764	28.0	.04	.34	1,000	C-2F	0.52
			1764LSV	28.0	.06	.34	25,000	C-2F	0.52
			CM8-361	28.0	.06	.6	5,000	C-2F	0.52
C	Wire Terminal Double Filament 	*	CM8-449	5.0	.12	.10	60,000	2/C-2R	0.425
		*	CM8-493	5.0	.12	.058	60,000	2/C-2R	
		*	CM8-441	5.0	.23	.29	16,000	2/C-2R	0.425
		*	CM8-492	5.0	.24	.38	3,000	2/C-2R	
D	Midget Flanged Base 		331	1.35	.06	.01	500	C-2R	0.625
			368	2.5	.20	.22	500	C-2R	0.625
			268	2.5	.35	.21	10,000	C-2R	0.625
			343	2.5	.40	.55	30	C-2R	0.625
			338	2.7	.06	.04	6,000	C-2R	0.625
			375	3.0	.015	.002	10,000	C-6	0.625
			CM8-782	5.0	.06	.032	200,000	C-2R	0.625
			CM8-783	5.0	.06	.053	100,000	C-2R	0.625
			CM8-815	5.0	.115	.147	40,000	C-2R	0.625
		B	CM8-428	5.0	.18	.35	3,000	C-2R	0.625
		B	CM8-432	5.0	.20	.45	500	C-2R	0.625
		B	CM8-433	5.0	.22	.60	500	C-2R	0.625
			CM8-435	5.0	.22	.10	3,000	C-2R	0.625

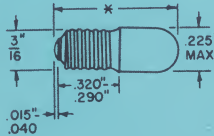
Symbol Explanation: **Bold face** type indicates Industry Standard lamps. **B**=Bulb MOD varies. * =Filaments in parallel for rating. ‡=Special Base. **=Longer lead length.



SUBMINIATURE INCANDESCENT LAMPS T

SECTION	Base	Symbols	Lamp Number	DESIGN		M.S.C.P.	Life (Hrs.)	Fila-ment Shape	* M.O.L. Inches
				Volts	Amps.				
T-13/4									
E	Midget Flanged Base 	B	345	6.0	.04	.03	10,000	C-2V	0.625
			CM8-70	6.0	.06	.05	500	C-2R	0.625
			332	6.0	.20	.10	50,000	C-2F	0.625
			328	6.0	.20	.34@5V	1,000	C-2R	0.625
			CM8-428L	6.0	.22	.63	3,000	C-2R	0.625
			380	6.3	.04	.02	50,000	C-2V	0.625
			CM8-668	6.3	.075	.22	500	C-2R	0.625
			350	6.3	.15	.45	3,000	C-2R	0.625
			381	6.3	.20	.40	50,000	C-2V	0.625
			349	6.3	.20	.55	3,000	C-2R	0.625
			344	10.0	.014	.008	10,000	C-2F	0.625
			367	10.0	.04	.08	30,000	C-2F	0.625
		B	CM8-944	11.0	.022	.03	10,000	C-2F	0.625
			382	14.0	.08	.30	50,000	C-2F	0.625
			330	14.0	.08	.50	750	C-2F	0.625
			8918	14.0	.088	.50	10,000	C-2F	0.625
			370	18.0	.04	.20	1,000	C-2F	0.625
			459	22.0	.04	.30	2,000	C-2F	0.625
			385	28.0	.04	.20	50,000	C-2F	0.625
			387	28.0	.04	.30	25,000	C-2F	0.625
			340	28.0	.04	.34	1,000	C-2F	0.625
			327	28.0	.04	.34	1,000	C-2F	0.625
			376	28.0	.06	.34	25,000	C-2F	0.625
			327LSV	28.0	.06	.34	25,000	C-2F	0.625
			CM8-365	28.0	.06	.6	5,000	C-2F	0.625

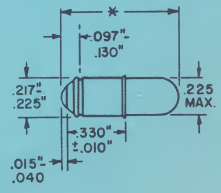
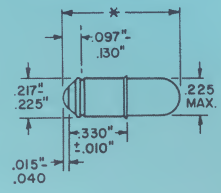
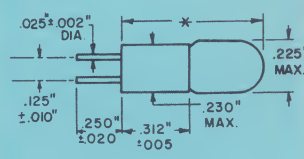
F	Midget Flanged Base Double Filament 	*	CM8-448	5.0	.12	.058	60,000	2/C-2R	0.562
		*	CM8-459	5.0	.12	.10	60,000	2/C-2R	0.625
		*	CM8-438	5.0	.23	.29	16,000	2/C-2R	0.562
		*	CM8-458	5.0	.24	.38	3,000	2/C-2R	0.625

G	Midget Screw Base 		CM8-669	1.35	.06	.01	500	C-2R	0.688
			1769	2.5	.20	.22	500	C-2R	0.688
			CM8-671	2.5	.40	.55	30	C-2R	0.688
			CM8-693	2.7	.06	.04	6,000	C-2R	0.688
			CM8-341	3.8	.4			S-2	0.80
			342	6.0	.04	.03	10,000	C-2V	0.688
			CM8-687	6.0	.20	.10	50,000	C-2F	0.688
			1768	6.0	.20	.34@5V	1,000	C-2R	0.688
			1775	6.3	.075	.22	500	C-2R	0.688
			1768L	6.3	.20	.55	3,000	C-2R	0.688
			378	6.3	.20	.40	50,000	C-2V	0.688
			CM8-691	10.0	.014	.008	10,000	C-2F	0.688
			CM8-362	14.0	.08	.30	50,000	C-2F	0.688
			373	14.0	.08	.50	750	C-2F	0.688
			CM8-536	18.0	.04	.20	1,000	C-2F	0.688
			CM8-437	22.0	.04	.30	2,000	C-2F	0.688
			CM8-384	28.0	.04	.20	50,000	C-2F	0.688
			CM8-388	28.0	.04	.30	25,000	C-2F	0.688
			335	28.0	.04	.34	1,000	C-2F	0.688
			335LSV	28.0	.06	.34	25,000	C-2F	0.688
			CM8-369	28.0	.06	.60	5,000	C-2F	0.688

Symbol Explanation: **Bold face** type indicates Industry Standard lamps. **B**=Bulb MOD varies. * =Filaments in parallel for rating. ‡=Special Base. **=Longer lead length.

T SUBMINIATURE INCANDESCENT LAMPS



SECTION	Base	Symbols	Lamp Number	DESIGN		M. S. C. P.	Life (Hrs.)	Fila- ment Shape	* M. O. L. Inches
				Volts	Amps.				
T-1 ³ / ₄									
H	Midget Grooved Base 		698	1.35	.06	.01	500	C-2R	0.625
			CM8-699	2.5	.20	.22	500	C-2R	0.625
			CM8-1079	2.5	.35	.21	10,000	C-2R	0.625
			CM8-703	2.5	.40	.55	30	C-2R	0.625
			CM8-704	2.7	.06	.04	6,000	C-2R	0.625
			CM8-705	6.0	.04	.03	10,000	C-2V	0.625
			CM8-706	6.0	.20	.10	50,000	C-2F	0.625
			337	6.0	.20	.34@5V	1,000	C-2R	0.625
			337L	6.3	.20	.55	3,000	C-2R	0.625
			CM8-708	6.3	.075	.22	500	C-2R	0.625
			379	6.3	.20	.40	50,000	C-2V	0.625
			398	6.3	.20	.55	3,000	C-2R	0.625
			709	10.0	.014	.008	10,000	C-2F	0.625
			397	10.0	.04	.08	30,000	C-2F	0.52
			386	14.0	.08	.30	50,000	C-2F	0.625
			336	14.0	.08	.50	750	C-2F	0.625
			346	18.0	.04	.20	1,000	C-2F	0.625
			457	22.0	.04	.30	2,000	C-2F	0.625
			388	28.0	.04	.30	25,000	C-2F	0.625
			334	28.0	.04	.34	1,000	C-2F	0.625
			334LSV	28.0	.06	.34	25,000	C-2F	0.625
J	Midget Grooved Base Double Filament 	*	CM8-958 (Major)	5.0	.264	.475	3,000	2/C-2R	0.625
			CM8-958 (Minor)				60,000		
K	Bi-Pin Base 	B	CM7-331	1.35	.06	.01	500	C-2R	0.625
			CM7-667	2.5	.20	.22	500	C-2R	0.625
			CM7-343	2.5	.40	.55	30	C-2R	0.625
			CM7-338	2.7	.06	.04	6,000	C-2R	0.625
			CM7-799	3.0	.015	.002	10,000	C-6	0.625
			CM7-428	5.0	.18	.34	3,000	C-2R	0.625
			CM7-345	6.0	.04	.03	10,000	C-2V	0.625
			CM7-328	6.0	.20	.34@5V	1,000	C-2R	0.625
			CM7-332	6.0	.20	.10	50,000	C-2F	0.625
			7380	6.3	.04	.02	50,000	C-2V	0.625
			CM7-708	6.3	.075	.22	500	C-2R	0.625
			CM7-328L	6.3	.20	.55	3,000	C-2R	0.625
			7381	6.3	.20	.40	50,000	C-2V	0.625
			CM7-344	10.0	.014	.002	10,000	C-2F	0.625
			7382	14.0	.08	.30	50,000	C-2F	0.625
			CM7-330	14.0	.08	.50	750	C-2F	0.625
			CM7-736	18.0	.04	.15	1,000	C-2F	0.625
			7387	28.0	.04	.30	25,000	C-2F	0.625
			7327	28.0	.04	.34	1,000	C-2F	0.625

Symbol Explanation: **Bold face** type indicates Industry Standard lamps. **B**=Bulb MOD varies. * = Filaments in parallel for rating. ‡ = Special Base. ** = Longer lead length.



GTL, SL, TL SHAPES LENS-END LAMPS

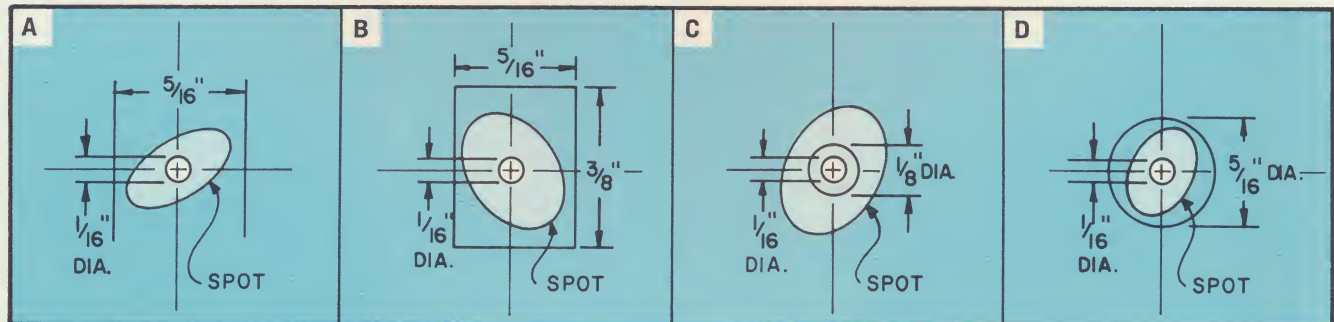
Style	Lamp Number	Envelope		Volts	Amps.	Base	Life (Hrs.)	Filament	Max. Overall Length	See Spot Characteristics Below
		Size	Shape							
  	CM8-1425	TL-3/4	J	5.0	.115	Wire Term.	16,000	C-2R	1/4"	None
	CM8-1415	TL-1	J	5.0	.115	Wire Term.	40,000	C-2R	5/16"	None
	CM8-759	TL-1 1/2	C	2.5	.15	Wire Term.	20	S-2	1 5/32"	None
	CM8-454	TL-1 1/2	C	2.5	.20	Wire Term.	500	C-2R	3/8"	None
	CM8-358	TL-1 1/2	A	2.5	.20	Mid. Screw	500	C-2R	1/2"	None
  	CM8-260	TL-1 1/2	C	2.5	.33	Wire Term.	30	C-2R	1/2"	None
	CM8-468	TL-1 1/2	C	6.0	.20	Wire Term.	500	C-2R	1/2"	None
	CM8-359	TL-1 1/2	A	6.0	.20	Mid. Screw	500	C-2R	3 3/64"	None
	CM8-469	TL-1 1/2	B	6.0	.20	Mid. Flange	500	C-2R	3 3/64"	None
	CM8-363	TL-1 1/2	C	28.0	.04	Wire Term.	1,000	C-2F	1 5/32"	None
  	CM8-364	TL-1 1/2	A	28.0	.04	Mid. Screw	1,000	C-2F	1 3/32"	None
	2140	GTL-1 3/4	G-I	2.5	.35	Wire Term.	10,000	C-2R	9/16"	None
	252	GTL-1 3/4	D	2.5	.35	Mid. Flange	10,000	C-2R	1 1/16"	A
	253	GTL-1 3/4	E	2.5	.35	Mid. Groove	10,000	C-2R	1 1/16"	A
	253X	GTL-1 3/4	E	2.5	.35	Mid. Groove	10,000	C-2R	1 1/16"	B
  	CM8-373	TL-1 3/4	E-I	2.5	.35	Mid. Groove	10,000	C-2R	5/8"	C
	CM8-374	TL-1 3/4	G	2.5	.35	Wire Term.	10,000	C-2R	1/2"	C
	261	GTL-1 3/4	E	2.5	.35	Mid. Groove	10,000	C-2R	1 1/16"	C
	CM8-299	TL-1 3/4	F	2.5	.35	Mid. Screw	10,000	C-2R	1 1/16"	None
	2136	GTL-1 3/4	G-I	2.5	.35	Wire Term.	10,000	C-2R	9/16"	D
  	2124	GTL-1 3/4	G-I	2.5	.35	Wire Term.	10,000	C-2R	9/16"	None
	CM8-426	TL-1 3/4	G	5.0	.18	Wire Term.	10,000	C-2R	1/2"	None
	CM8-549	TL-2	H	3.5	.36	Wire Term.	400	C-2R	9/16"	None
	CM8-188	TL-2	H	3.8	.30	Wire Term.	150	C-2R	3 1/64"	None
	CM8-290	TL-2 3/4	L	3.8	.35	Wire Term.	400	C-2R	1 1/16"	None
 	CM8-503	TL-2 3/4	M	6.3	.35	Min. Bay.	1,000	C-2R	1"	None
	CM8-219	TL-2 3/4	K	6.3	.32	Min. Screw	100	C-2R	1 1/16"	None
	CM8-220	TL-2 3/4	M	6.3	.33	Min. Bay.	50	C-2R	1 1/16"	None
	CM8-750	TL-2 3/4	L	6.3	.19	Wire Term.	150	C-2R	1 1/16"	None
	CM8-740	SL-2 1/2	P	3.8	.38	Wire Term.	500	C-2R	2 3/32"	None
	CM8-564	SL-2 1/2	R	3.2	.45	Wire Term.	500	C-2R	1 5/32"	None
	CM8-282	SL-2	R	3.8	.33	Wire Term.	200	C-2R	1"	None

FOOTNOTES: All lens end lamps listed are available in the style base most suitable to the application on special order.

SPOT CHARACTERISTICS

Spots produced by lens-end lamps vary in shape from elliptical to round. Their respective spot characteristics are defined in the following manner:

1. With the lamp .375" from tip to surface, the spot shape is defined within the limits shown below. The filament must be positioned in the vertical plane and the solder spot (groove base) should be 25° maximum from the vertical axis. The spot must completely cover a 1/16" diameter circle.
2. Within the 1/16" diameter circle a minimum of 750 foot candles must be maintained when operating at 2.5 volts and at a distance of .375".



T HELIUM RETARDANT LAMPS



Helium retardant lamps are utilized in applications which require a helium fill for leak checking, heat sinking, lubrication, or low resistance (drag) atmosphere. Although helium permeation cannot be completely stopped, the rate is decreased by the use of thicker walled glass envelopes.

Ordering Information

Listed are currently available Helium Retardant Lamps. To order these or to discuss any special applications of this type, please contact the factory or your local CMLW representative.

SECTION	Base	Lamp Number	DESIGN		M.S.C.P.	Life (Hrs.)	Fila-ment Shape	* M.O.L. Inches
			Volts	Amps.				
T-1								
A		6806	5.0	0.06	0.03±25%	60,000	C-2R	.25
		6806AS15	5.0	0.06	0.03±15%	60,000	C-2R	.25
		6807	5.0	0.06	0.05±25%	40,000	C-2R	.25
		6807AS15	5.0	0.06	0.05±15%	40,000	C-2R	.25
		6808	5.0	0.075	0.09±25%	16,000	C-2R	.25
		6808AS15	5.0	0.075	0.09±15%	16,000	C-2R	.25
		6809	5.0	0.115	0.15±25%	16,000	C-2R	.25
		6809AS15	5.0	0.115	0.15±15%	16,000	C-2R	.25
B		930	5.0	0.06	0.03±25%	60,000	C-2R	.375
		930AS15	5.0	0.06	0.03±15%	60,000	C-2R	.375
		931	5.0	0.06	0.05±25%	40,000	C-2R	.375
		931AS15	5.0	0.06	0.05±15%	40,000	C-2R	.375
		933	5.0	0.075	0.09±25%	16,000	C-2R	.375
		933AS15	5.0	0.075	0.09±15%	16,000	C-2R	.375
		932	5.0	0.115	0.15±25%	16,000	C-2R	.375
		932AS15	5.0	0.115	0.15±15%	16,000	C-2R	.375
T-1¼								
C		1189AS25	5.0	0.06	0.03±25%	60,000	C-2R	.25
		1189AS15	5.0	0.06	0.03±15%	60,000	C-2R	.25
		1190AS25	5.0	0.06	0.05±25%	40,000	C-2R	.25
		1190AS15	5.0	0.06	0.05±15%	40,000	C-2R	.25
		1191AS25	5.0	0.075	0.09±25%	16,000	C-2R	.25
		1191AS15	5.0	0.075	0.09±15%	16,000	C-2R	.25
		8515AS25	5.0	0.115	0.15±25%	16,000	C-2R	.25
		8515AS15	5.0	0.115	0.15±15%	16,000	C-2R	.25
T-1¾								
D		339AS25	5.0	.20	.34±25%	15,000	C-2R	.625
		339AS15	5.0	.20	.34±15%	15,000	C-2R	.625
E		341AS25	5.0	.20	.34±25%	15,000	C-2R	.625
		341AS15	5.0	.20	.34±15%	15,000	C-2R	.625



CM8 SERIES LINE FILAMENT LAMPS

THIN LINE AND STRAIGHT LINE LAMPS

For photosensor use, Thin Line and Straight Line lamps are ideal since they produce a concentrated line of infrared energy at constant temperature. These parameters are important when designing energy sources for photosensor or photoelectric assemblies.

As indicator devices Thin Line and Straight Line lamps are well suited for use in readouts, lighted panels, displays, and optical equipment. The line of light produced by these lamps eliminates the need for grouping several miniature lamps together. When Thin Line and Straight Line lamps are used for lighting or indication purposes, lamps less re-

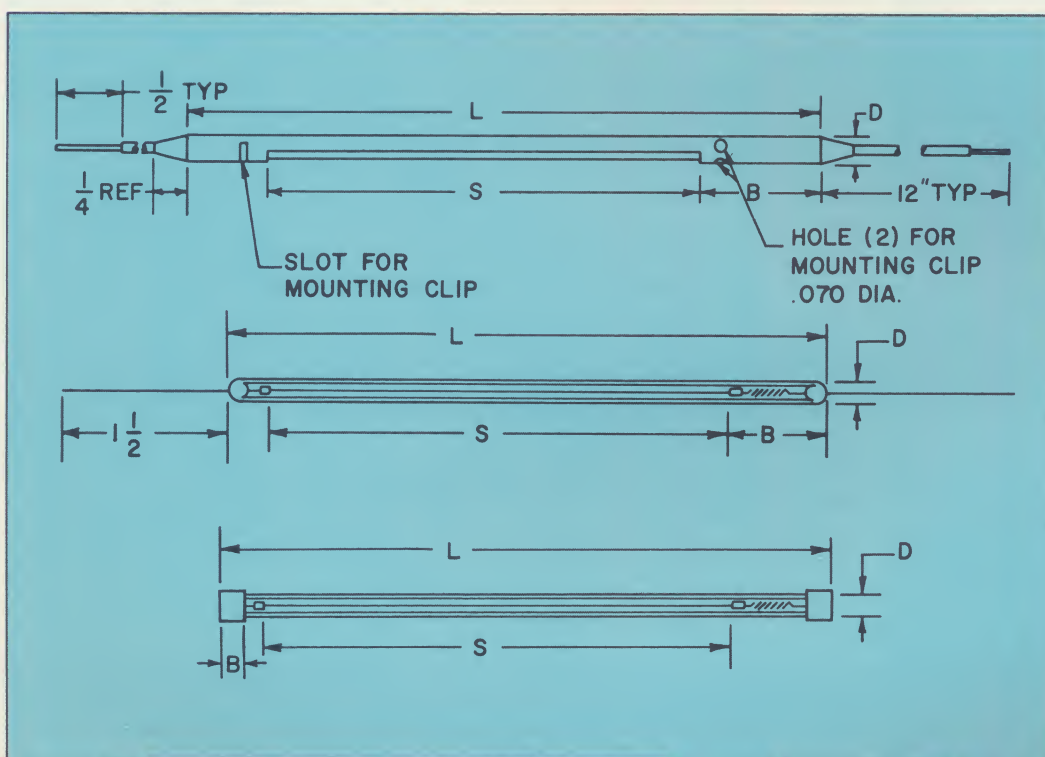
flectors are recommended. This permits packaging or mounting the lamps within the mechanical limitations of the equipment. Thin Line and Straight Line lamps are available in varying filament lengths and filament diameters.

Two Thin Line lamps are provided with reflective sleeves for mounting and heat sink purposes. These lamps have window openings of $1\frac{1}{16}$ inches for tape reader use and $3\frac{1}{4}$ inches for tab card use. Accessory mounting clips are available also to simplify mounting.

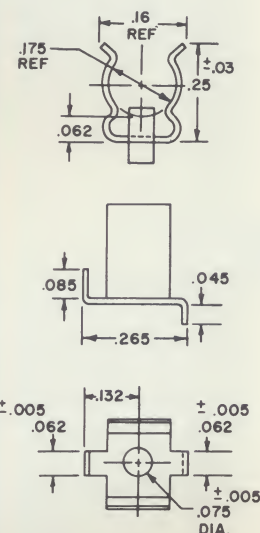
ORDERING INFORMATION

To order standard Thin Line and Straight Line lamps, please specify part numbers shown.

THIN LINE LAMP DIMENSIONS AND SPECIFICATIONS



MOUNTING CLIP



CML 10384

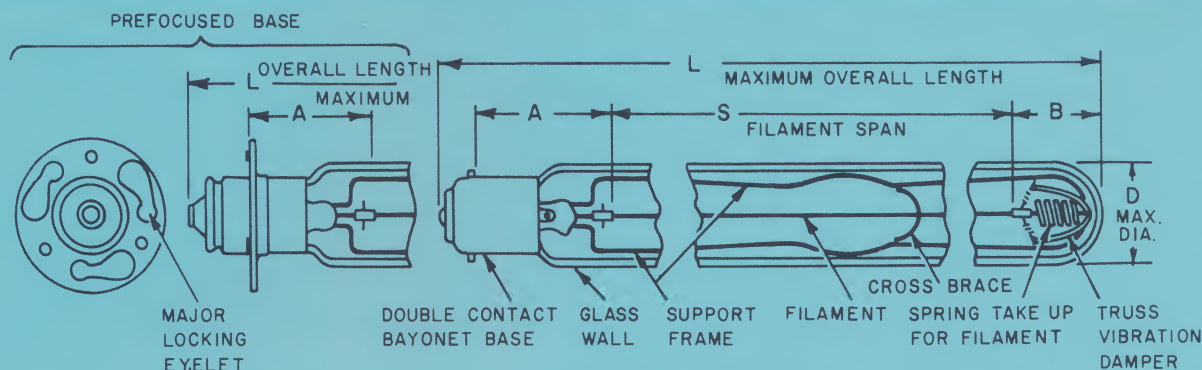
Part	Nominal Dimensions (Inches)				Base	Filament Diameter	Range				Filament Temp. K°	Average Life (Hours)	Notes
	S	D	L	B				Volts	Amps.	Watts			
CM8-1121	1.25	.15	2.15	.57	Wire Term.	.002	From To	3.0 5.0	.41 .52	1.2 2.6	1,800 2,100	50,000 5,000	1, 2, 3
CM8-1127	1.50	.15	2.40	.57	Wire Term.	.002	From To	3.6 5.8	.42 .52	1.5 3.0	1,800 2,100	50,000 5,000	1, 2, 3
CM8-1153	3.50	.15	4.53	.63	Wire Term.	.002	From To	11.0 16.0	.40 .46	4.4 7.4	1,800 2,100	50,000 5,000	1, 2
CM8-1123	1.06	.187	2.75	.97	Mounted In Reflector	.002	From To	3.6 5.0	.42 .50	1.5 2.5	1,800 2,000	50,000 10,000	4
CM8-1126	3.25	.187	4.75	.88	Mounted In Reflector	.002	From To	11.0 14.2	.40 .44	4.4 6.3	1,800 2,000	50,000 10,000	4
CM8-1181	1.25	.19	2.10	.312	End Cap	.002	From To	3.0 5.0	.41 .52	1.2 2.6	1,800 2,100	50,000 5,000	1, 4
CM8-1162	.562	.19	1.60	.312	End Cap	.002	From To	1.44 2.20	.42 .52	.6 1.1	1,800 2,100	50,000 5,000	1, 4

NOTES: Available with: 1. Silvering. 2. Reflector Mount. 3. End Caps. 4. Mounting Clips CML-10384.

CM8 SERIES LINE FILAMENT LAMPS



STRAIGHT LINE LAMP DIMENSIONS AND SPECIFICATIONS



Part Number	Nominal Dimensions (Inches)					Base	Filament	Range				Foot Candles 1" From Filament (Approx.)	Filament Temp. K°	Life (Hours) (Approx.)	Notes
	S	D	L	A	B				Volts	Amps.	Watts				
CM8-955	1.10	.620	2.62		.438	Wire Term. No Base	.004" Dia.	From To	5.0 6.0	1.60 1.75	8 10.5		2,400 2,500	500 75	1
CM8-160	1.38	.73	3.40	1.10		Double Contact Bayonet	.0015" x 0.2" Ribbon .020"	From To	5.70 10.10	3.33 4.51	19.0 4.55	424 6,624	2,100 2,600	5,000+ 400	
CM8-55	1.38	.73	3.41	1.1	.50	Double Contact Bayonet	.005" Dia.	From To	3.1 6.0	1.78 2.44	5.54 14.5	130 2,200	2,000 2,600	5,000+ 300	2
CM8-40	1.38	.73	3.41	1.1	.50	Double Contact Bayonet	.005" Dia.	From To	3.70 6.70	2.2 2.8	8.1 18.8	140 2,100	2,000 2,600	5,000+ 200	2
CM8-31	1.38	.73	3.41	1.1	.50	Double Contact Bayonet	.003" Dia.	From To	3.15 7.10	.72 1.18	2.2 8.4	80 1,500	2,000 2,600	5,000+ 75	2
CM8-31A	1.38	.728	3.41		.50	Double Contact Bayonet	.003" Dia.	From To	3.15 7.10	.72 1.18	2.2 8.4	80 1,500	2,000 2,600	5,000+ 75	2
CM831B	1.38	.728	3.37	1.05	.50	Double Contact Prefocused	.003" Dia.	From To	3.15 7.10	.72 1.18	2.2 8.4	80 1,500	2,000 2,600	5,000+ 75	2
CM8-56	1.38	.73	3.41	1.1	.50	Double Contact Bayonet	.002" x .010" Ribbon	From To	4.00 7.7	2.3 3.1	9.2 24.0	230 4,100	2,000 2,600	5,000+ 125	2
CM8-50	2.00	.71	4.00	1.38	.625	Double Contact Bayonet	.006" Dia.	From To	5.75 10.85	2.9 4.0	16.7 43.4	14 158	2,200 2,800	3,000 10	
CM8-50B	2.00	.71	4.00	1.38	.625	Single Contact Bayonet	.006" Dia.	From To	5.75 10.85	2.9 4.0	16.7 43.4	14 158	2,200 2,800	3,000 10	
CM8-63A	1.50	.72	4.0			Double Contact Bayonet	.006" Dia.	From To	4.5 6.70	3.0 3.6	13.5 24.1		2,200 2,600	3,000 125	
CM8-34	2.44	.73	4.50	.96	.75	Single Contact Prefocused	.005" Dia.	From To	4.20 9.60	1.4 2.25	6.0 21.0		2,000 2,600	5,000+ 160	4
CM8-62	2.50	.73	4.75	1.06	.75	Single Contact Prefocused	.002" x .020" Ribbon	From To	11.0 16.0	3.7 4.4		1,100 6,300	2,200 2,600	2,500 200	2
CM8-52	3.18	.73	5.5	1.215	.75	Double Contact Prefocused	.0015" x .02" Ribbon	From To	10.5 20.0	3.25 4.50	33 90	1,000 17,000	2,000 2,600	5,000+ 400	2
CM8-52A	Same as CM8-52 Except Has .73 x 3.25 Light Absorbing Background.														
CM8-42	3.0	.73	5.2	1.1	.75	Double Contact Bayonet	.006" Dia.	From To	6.90 12.60	2.90 3.80	20 48	150 2,500	2,000 2,600	5,000+ 175	2
CM8-45	3.38	.73	5.5	1.1	.75	Double Contact Bayonet	.006" Dia.	From To	7.5 14.0	2.75 3.70	21 52	160 2,700	2,000 2,600	5,000+ 190	2
CM8-48	7.5	.73	10.5	1.4	1.00	Double Contact Bayonet	.006" Dia.	From To	17.0 31.0	2.85 3.85	48 120	165 2,800	2,000 2,600	5,000+ 230	2, 3
CM8-48A	7.75	.73	10.5	1.4	1.00	Double Contact Bayonet	.006" Dia.	From To	17.5 32.0	2.85 3.85	50 125	165 2,800	2,000 2,600	5,000+ 230	2, 3
CM8-48B	7.75	.73	10.5	1.4	1.00	Double Contact Bayonet	.006" Dia.	From To	17.5 32.0	2.85 3.85	50 125	165 2,800	2,000 2,600	5,000+ 200	2

NOTES: 1. Filament off center—Located 1/8" from inside wall of glass envelope. 2. Equipped with Truss Vibration Damper. 3. Equipped with Cross Brace Reinforcement. 4. Equipped with dull black matte background inside glass envelope to eliminate reflections from glass.



NEON GLOW LAMPS

Neon glow lamps are popular, low priced devices which have found broad acceptance for indicator and circuit control applications. These lamps are cold-cathode gas discharge types. Basically their structure consists of two electrodes spaced a short distance apart within a glass envelope. The envelope is filled with gas which ionizes and glows when voltage is applied. Chicago Miniature offers a large selection of glow lamps either with or without resistors to meet most exacting requirements.

ORDERING INFORMATION

When ordering lamps specify part numbers listed. You may safely order by either number.

If the glow lamps you need are not listed, please send us your specifications so we may quote you.



Lamp Number	Circuit Volts	Nominal Current (MA)	Nominal Watts	Bulb	Base	MOL	Max. Starting Voltage		Series Resistance (Ohms)	Average Useful Life
							AC	DC		
A1A (NE-2)	105-125	.3	1/25	T-2	Wire Term.	1 1/16	65	90	200,000X	25,000
A1B ———	105-125	.3	1/25	T-2	Wire Term.	1/2	65	90	220,000X	25,000
A1C ———	105-125	.8	1/10	T-2	Wire Term.	1/2	95	135	68,000X	25,000
A1D ———	105-125	.3	1/25	T-2	Wire Term.	1/2	65	90	220,000X	25,000
A2A (NE-2A)	105-125	.3	1/25	T-2	Wire Term.	27/32	65	90	200,000X	25,000
A9A (NE-2E)	105-125	1.0	1/10	T-2	Wire Term.	3/4	65	90	62,000X	5,000
B1A (NE-51)	110-125	.3	1/25	T-3 1/4	Min. Bayonet	1 1/16	65	90	200,000X	15,000
B2A (NE-51H)	110-125	2.0	1/4	T-3 1/4	Min. Bayonet	1 1/16	95	135	25,000X	5,000
B7A (NE-45)	110-125	2.0	1/4	T-4 1/2	Cand. Screw	1 17/32	65	90	30,000	7,500
B8A (NE-47)	110-125	2.0	1/4	T-4 1/2	S.C. Bayonet	1 1/2	65	90	30,000X	7,500
B9A (NE-48)	110-125	2.0	1/4	T-4 1/2	D.C. Bayonet	1 1/2	65	90	30,000X	7,500
C2A (NE-2H)	105-125	2.0	1/4	T-2	Wire Term.	3/4	95	135	22,000X	5,000
C7A (NE-20)	105-125	1.0	1/10	T-2	S.C. Mid. Flng.	1 5/16	65	90	62,000X	5,000
C9A (NE-2J)	105-125	2.0	1/4	T-2	S.C. Mid. Flng.	1 5/16	95	135	22,000X	5,000

NOTE: X = External series resistance of this value required for nominal current operation.

CM21 SERIES SOCKETS FOR CM7 BI-PIN LAMPS

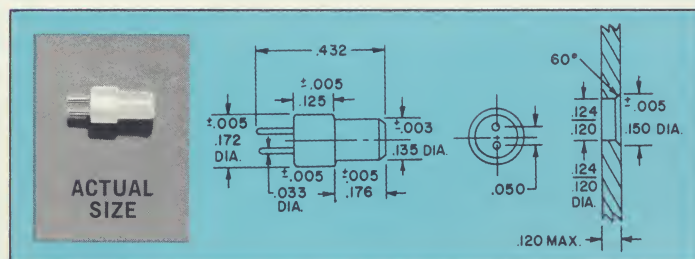
Chicago Miniature CM21-1 and CM21-2 Series push-fit teflon Sockets are designed to accept popular CM7 Bi-Pin Lamps. Teflon socket bodies permit easy and fast installations by snapping the sockets directly into panels, brackets and printed circuit boards. CM21-1 beryllium copper contacts and CM21-2 phosphor bronze contacts are plated gold

over silver. CM21-1 sockets on .050" pin centers, accept T-3/4 and T-1 Bi-Pin Lamps. CM21-2 sockets on .125" pin centers, accept T-1 1/4 and T-1 3/4 Bi-Pin Lamps.

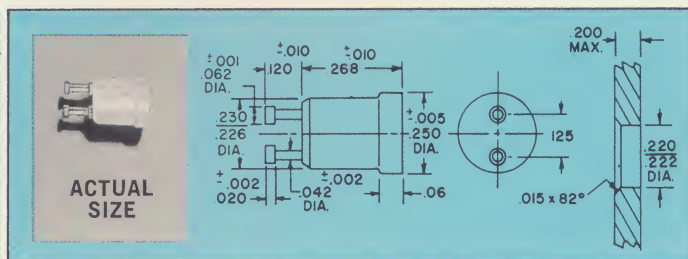
Order CM21 Series Sockets by part numbers.

To specify and order CM7 Series Bi-Pin Lamps, please refer to the Lamp Section for part numbers.

DIMENSIONS



CM21-1 Socket .050" pin centers for T-3/4 and T-1 Bi-Pin Lamps.



CM21-2 Socket .125" pin centers for T-1 1/4 and T-1 3/4 Bi-Pin Lamps.

SPECIAL AND STANDARD "HDR" PRODUCTS



Products illustrated represent a general cross-section of standard and special items available through the Chicago Miniature "HDR" (Hardware) Division.

A. CM 22 SERIES PEANUT LITE (T-1)

B. CM 22 SERIES PEANUT LITE
(T-1 3/4 and NEON)

C. CM 25 SERIES BRITE LITE

D. CML SERIES CARTRIDGE INDICATORS
and HOLDERS

E. CM 20 SERIES LENS END ASSEMBLIES
(BEAM EMITTERS)

F. CM 24 SERIES CARD LITE

G. CM 20 SERIES LENS END ASSEMBLIES





CM23 SERIES FLYING SAUCERS

GENERAL INFORMATION AND APPLICATION

The T-1 Flying Saucer Assembly is a new concept in panel lighting. The assembly consists of two major components: a colored filter and a lamp cap.

The filter is either permanently bonded into the panel or mounted on a P.C. board and provides colors of red, blue/white, or clear. The lamp cap threads into the filter and illuminates the panel with one foot lambert of surface brightness minimum out to a $2\frac{3}{8}$ inch diameter circle when using a clear filter and 5.0V 60ma lamp cap, or, red filter and 5.0V 115ma lamp cap.

ADVANTAGES

For Panel Manufacturers

- Up to 50% savings in number of lamps required.
- Up to 50% reduction in filter and lamp installation time.
- Faster light balancing.
- Permanent filters with non-shift colors.
- Higher production rates.
- Quick lamp replacement in case of early random lamp failure.

For Panel Users

- Replaceable T-1 lamp within the maximum allowable panel thickness of .220".
- Clean front panel face.
- Field serviceability.
- No special tools required.
- Less power consumption.
- Faster delivery.
- Equivalent panel costs.

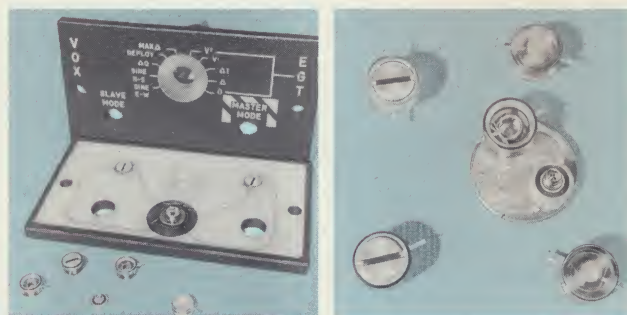
MATERIALS AND FINISHES

- Filter: Tenite
- Ground Contact: Brass (Silver Plated)
- Hot Contact: Brass (Silver Plated)
- Lamp Insulator Disk: Rigid Vinyl
- Lamp Insulator Ring: Tenite
- Center Lamp Contact: Brass (Silver Plated)
- Heat Sink: Brass

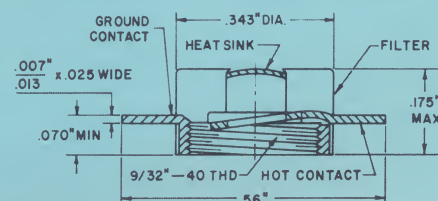
ORDERING INFORMATION

FILTER ASSEMBLIES		
Rear Mount Part No.	Color/Spec.	P.C. Mount Part No.
CM23-11-01	Red/MIL-C-25050	CM23-12-01
CM23-11-02	Blue-White/MIL-L-27160	CM23-12-02
CM23-11-03	Clear/MIL-P-7788	CM23-12-03

LAMP CAP SPECIFICATIONS				
Part No.	Volts	Amps	M.S.C.P.	Life Hours
CM23-21-01	5.0	.060 $\pm$ 10%	.03 $\pm$ 15%	100M
CM23-21-02	5.0	.060 $\pm$ 10%	.05 $\pm$ 15%	100M
CM23-21-03	5.0	.075 $\pm$ 10%	.09 $\pm$ 15%	25M
CM23-21-04	5.0	.115 $\pm$ 10%	.15 $\pm$ 15%	40M



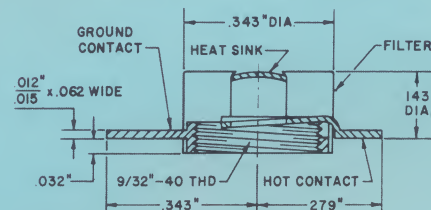
CM23-11-XX Rear Mount Filter



INSTALLATION OF ASSEMBLY:

- Make cutouts for filter and wire.
- Lay filter only in cutout and solder wires.
- Bond filter into cutout with solvent cement.
- Install lamp.

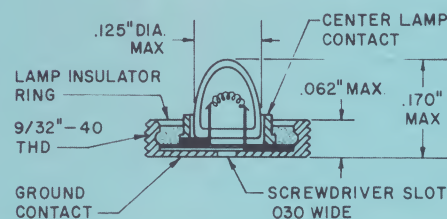
CM23-12-XX P.C. Mount Filter



INSTALLATION OF ASSEMBLY:

- Make cutouts for filter and mounting tabs.
- Solder filter to printed circuit board.
- Install lamp.

CM23-21-XX Lamp Cap



S REFERENCE INDEX



SEC- TION	PART NO.	PAGE NO.	SEC- TION	PART NO.	PAGE NO.	SEC- TION
—	CM8-610	4	A	CM8-771	4	A
A	CM8-619	6	A	CM8-773	6	A
A	CM8-621	2	D	CM8-782	7	D
—	CM8-624	5	D	CM8-783	7	D
A	CM8-625	3	E	CM8-785	6	A
—	CM8-628	4	C	CM8-798	2	D
—	CM8-631	4	A	CM8-799	6	A
—	CM8-634	4	A			
A	CM8-636	4	C	CM8-805	6	A
A	CM8-637	4	C	CM8-806	6	A
A	CM8-637L	4	C	CM8-807	6	A
G	CM8-640	4	A	CM8-813	6	A
—	CM8-641	5	D	CM8-815	7	D
—	CM8-644	5	D	CM8-816	4	A
B	CM8-645	5	D	CM8-826	5	F
G	CM8-646	4	C	CM8-827	4	A
—	CM8-647	5	F	CM8-840	4	A
—	CM8-654	5	F	CM8-841	4	A
E	CM8-655	4	A	CM8-846	2	D
G	CM8-656	4	C	CM8-847	4	A
—	CM8-657	5	F	CM8-853	4	A
—	CM8-658	5	C	CM8-857	4	A
G	CM8-660	4	C	CM8-858	4	A
G	CM8-661	4	A	CM8-860	3	B
A	CM8-662	5	D	CM8-863	3	B
A	CM8-663	6	A	CM8-870	3	B
A	CM8-664	6	A	CM8-871	3	B
E	CM8-665	2	D	CM8-900	2	D
A	CM8-668	8	E	CM8-944	8	E
A	CM8-669	8	G	CM8-946	7	B
B	CM8-671	8	G	CM8-955	13	—
—	CM8-672	4	C	CM8-958	9	J
D	CM8-673	5	D	CM8-961	5	A
E	CM8-675	5	E	CM8-962	5	A
D	CM8-676	4	A	CM8-963	5	A
D	CM8-683FI	2	D	CM8-969	5	A
D	CM8-687	8	G	CM8-970	5	A
G	CM8-691	8	G	CM8-971	5	A
F	CM8-693	8	G	CM8-972	5	A
C	CM8-699	9	H	CM8-973	5	A
A	CM8-703	9	H	CM8-975	5	A
A	CM8-704	9	H	CM8-1062	2	D
F	CM8-705	9	H	CM8-1079	9	H
C	CM8-706	9	H	CM8-1083	6	A
A	CM8-708	9	H	CM8-1086	2	D
—	CM8-711	2	D	CM8-1088	3	A
F	CM8-712	2	A	CM8-1089	3	A
F	CM8-715FI	3	A	CM8-1092	3	A
A	CM8-718FI	3	E	CM8-1096	3	A
—	CM8-725FI	2	A	CM8-1097	3	E
—	CM8-728	6	A	CM8-1098	3	E
C	CM8-729	2	D	CM8-1099	3	E
C	CM8-732	2	D	CM8-1100	3	E
—	CM8-734	5	B	CM8-1102	3	E
A	CM8-740	10	—	CM8-1103	3	E
A	CM8-742	4	A	CM8-1111	3	A
A	CM8-743	4	A	CM8-1112	3	E
A	CM8-745	5	A	CM8-1121	12	—
G	CM8-747	6	A	CM8-1123	12	—
A	CM8-748	6	A	CM8-1126	12	—
—	CM8-749	5	A	CM8-1127	12	—
D	CM8-750	10	—	CM8-1153	12	—
—	CM8-756	6	A	CM8-1162	12	—
A	CM8-757	6	A	CM8-1175	3	A
D	CM8-758	4	A	CM8-1175AS15	3	A
E	CM8-759	10	—	CM8-1179	3	A
D	CM8-762	5	A	CM8-1179AS15	3	A
F	CM8-767	4	A	CM8-1181	12	—
A	CM8-768	4	A	CM8-1415	10	—
C	CM8-769	4	A	CM8-1425	10	—



PIONEERING LEADERSHIP

Founded in 1910, Chicago Miniature Lamp Works has been in existence almost as long as the electric lamp industry itself. During this period of continuous leadership and growth, the firm has pioneered the development of subminiature lamps, lamp products and applications . . . establishing an outstanding reputation for quality, integrity and ingenuity.

UNSURPASSED RELIABILITY

Above all, Chicago Miniature's many thousands of subminiature devices—whether stock items or those created for highly specialized functions—have compiled an enviable record of **reliability**. This has been achieved mainly through constant research and development, and the highest degree of engineering and manufacturing excellence.

COMPETITIVE PRICES

Chicago Miniature, while pledged to a continuing program to supply the finest lamp products available, believes that quality need not be expensive. While maintaining unquestioned superiority in engineering design, volume production makes possible our lower costs. At Chicago Miniature, better products and better service go hand-in-hand with competitive prices.



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